

Unit 3
Animals: Structure and Function

Topics: The Respiratory System
Transportation and Circulation
Nutrients, Digestion and Nutrition

The Respiratory System

Reference: Chapter 8

The objective of all respiratory systems is gas exchange, that is, the exchange of oxygen and carbon dioxide between an organism and its environment.

Every respiratory system has 2 requirements:

- 1) A large surface area for gas exchange.
- 2) The site of gas exchange must be moist so that the O_2 and CO_2 gases can dissolve.

Gas exchange systems can be extremely simple, or very complex, depending on the organism.

Examine the various respiratory systems of simple to complex organisms as seen on pages 250-255 and complete the comparison table.

The Human Respiratory System

Reference: pp. 256-259

In humans respiration consists of the following processes:

-Breathing = inspiration + expiration

-External Respiration = the exchange of oxygen and carbon dioxide between the air and blood

-Internal Respiration = the exchange of oxygen and carbon dioxide between the blood and the cells of the body

-Cellular Respiration = the series of chemical reactions that occur in the mitochondria of cells

The human respiratory system is divided into the upper respiratory tract and the lower respiratory tract.

Read about the parts of the respiratory tract and complete the table with details of each organ (structures and functions).

The Mechanics of Breathing

Reference: pp. 260-262

Structures:

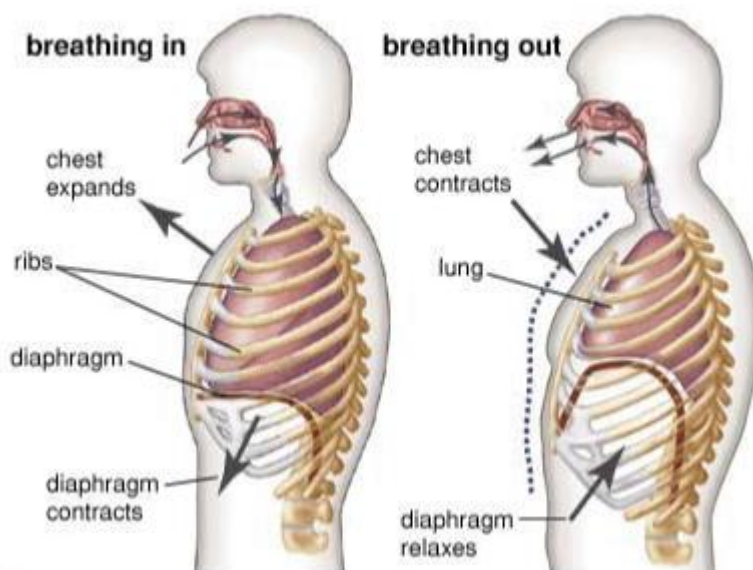
- intercostal muscles attach from the rib above to the rib below
- lungs are connected to rib cage and diaphragm by pleural membranes
- between pleural membranes is pleural fluid

Inhalation (=inspiration)

- intercostal muscles between the ribs contract
- diaphragm contracts and moves down
- chest cavity expands
- air pressure inside the lungs is reduced which causes air from outside to rush in

Exhalation (=expiration)

- intercostal muscles and diaphragm relax
- diaphragm moves upward
- chest cavity reduces in size
- air pressure is greater inside than outside, so air is forced out of the lungs



The Control of Breathing

After reading pages 268 - 270, write a **summary** that includes the following details:

- What processes are involved in the control of breathing?
- What structures are involved in the control of breathing?
- Why is it difficult to control your own breathing?